## REMARKS

The Office Action of October 10, 2003 has been studied in detail along with the references applied and cited by the Examiner. In response, selected claims have been amended (7, 8, 9, 10, and 12). The pending claims should be read in conjunction with the accompanying arguments in support of patentability. Further examination and reconsideration of the application as amended are respectfully requested.

**The Office Action**

Claims 1-6 and 13-23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Van Lierop, et al. (U.S. Patent No. 5,557,169) in view of Tessmann (U.S. Patent No. 3,259,969).

Claims 7-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Van Lierop, et al. in view of Freeman (U.S. Patent No. 3,132,409).

Claim 11 has been allowed.

Claim 12 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Van Lierop, et al. in view of Anderson, et al. (U.S. Patent No. 2,687,489).

Rejections under 35 U.S.C. §103(a)

The Examiner rejected claims 1-6 and 13-23 under 35 U.S.C. §103(a) as being unpatentable over Van Lierop, et al. in view of Tessmann. The Examiner states that "while the Van Lierop reference fails to explicitly disclose a cutting function step, it is the Examiner's position that such limitation is inherently disclosed by Van Lierop's teachings of the structural limitations, i.e., the wire components are cut to a desired length during manufacturing process of the electrode structure." The Examiner further states that "Van Lierop is silent in regards to the limitation of joining the wire segments and cutting the material after the joining step [claim 1] or the use of collets during the joining and cutting steps [claim 2]. The Examiner relies on the teachings of Tessmann to teach joining and handling wire sections with the use of collets assemblies in order to obtain proper handling of the wire segments and facilitate a cutting process to specific wire lengths while avoiding any mishandling of the excess material cut from the main material component. Furthermore, in the Examiner's view, cutting the material after proper joining of the wire segments would have been obvious to one of ordinary skill in the art, since such step would allow an adequate handling of the minute wire segments and facilitate cutting to specific wire lengths, particularly minute lengths.

The refer nces contain no motivation or suggestion to combine the references.

Furthermore, T ssmann teaches away from Van Lierop. In particular, one of the objects of the Van Lierop disclosure is "to provide a measure whereby an electric lamp of the kind mentioned in the opening paragraph can be manufactured with less wastage". The electric lamp of Van Lierop relates to a lamp vessel which is sealed in a gas like manner and has a wall of ceramic material. At least one current supply conductor is connected to an electric element arranged in the lamp vessel, which current supply conductor issues from the lamp vessel to the exterior via a lead through channel in the wall. The conductor comprises a first part with a comparatively high melting point and a second part with a comparatively low melting point, which parts form a welded joint with mutually facing ends. Van Lierop describes the current process of welding together the parts of the current supply conductor. The process described includes a thickening that often arises around the boundary between the parts, which prevents the current supply conductor fitting in the lead through channel or being passed through the channel. This leads to a comparatively high wastage of current supply conductors, which adversely affects the cost price. Mechanical removal of the thickened portion, such as by grinding, involves an elaborate additional operation. (Col. 1, lines 55-63).

In contrast, Tessmann describes a method of making the butt welded joints which deliberately creates waste and additional operations to remove material around a welded joint. Referring to column 4 in Tessmann, the welded joint is described as a bulbous region which moves radially outwardly to form a doughnut, i.e. the outer edges of the moved metal may be serrated or cracked because of the excessive tensile forces impressed thereon by the expansion or extension of the material radially outwardly from between the chucks. (Col. 4, lines 12-18). This excess material comprised in the doughnut must thereafter be sheared and pulled from the welded joint. The doughnut material represents wasted material. The operative steps for removing the doughnut include a first chuck which is loosened and moved back away from a second chuck a distance approximately equal to two diameters of the wire. The loosened and removed chuck 18 is then reclamped on the wire at a new location, and the second chuck is loosened from the wire section but held against axial movement and, by an appropriate operation of the welding apparatus, the reclamped first chuck and the wire held thereby are moved toward the loosened second chuck. Since the second chuck at the start of the axial movement of the wire is in abutting relation to the doughnut, the axial movement of the first chuck and the wire held thereby toward the axially held second

chuck results in a shearing of the doughnut from the welded region of the wire and in a displacement of the doughnut to a position in abutting relation to the first chuck. (Col. 4, lines 22-38). The loosened doughnut must then be snipped off from the wire. Even after these additional steps, the diameter of the wire at the weld is "slightly larger than that of the wire adjoining the weld". (Col. 4, lines 45-46). Thus, not only does Tessmann create waste and necessitate additional steps for removing material around the weld joint, the weld joint includes a larger diameter than the adjoining wire. This disclosure does not offer a solution which is combinable with Van Lierop and teaches away from combining these two references.

Furthermore, Tessmann describes a method of making butt welded joints such that "the frequency with which a joint is to be made is not very high and hence the apparatus selected to form the joint need not be of a high speed automatic type. In fact, it has been found that relatively simple known wire holding chucks modified as described below and operated through cams from a lever manually operated may suffice for this purpose". (Col. 2, lines 59-65). Additionally, Tessmann states that it is desirable to form the wire in a continuous length of a predetermined dimension. Such lengths are wound on a spool for sale to the public, and each spool must contain a continuous length of the size defined on the spool label. As such, Tessmann involves butt welding joints between the same wire material having the same diameter on each side of the joint. Due to the infrequency of the butt welds, additional waste and operative steps do not present an impediment to this method.

Tessmann further describes the use of making butt welded joints which is particularly well adapted for use with materials which have the characteristic of hardening when worked. Typical of such materials are aluminum, copper and stainless steel. (Col. 1, lines 8-12). The specific object of the invention "has within its purview the provision of a method of joining together two sections of wire of work hardenable material by a known butt welding process which produces an upset region at the joint, and then removing the excess material at the joint while at the same time work hardening the material of the joint to bring its tensile strength up to that of the wire at either side of the joint". (Col. 2, lines 2-8). The wire at either side of the joint are of the same material, the same diameter, and of the same melting point. In contrast, Van Lierop discloses a current supply conductor which includes three different materials (i.e. molybdenum, niobium, and tungsten) each having a different diameter and a different melting point. Because the frequency of the joints is high and the metals used

expensive, creating waste at the joint is cost prohibitive. Additionally, using the shearing step as described in Tessmann would be l ss effectiv and create a bulge or enlargement at the weld joint due to the dissimilar diameters of the materials being welded in Van Lierop. Also, applying the shearing motion which in Tessmann is described as operative in opposing directions, would create different effects in Van Lierop. Specifically, shearing from the smaller diameter coil towards the larger diameter coil would have a different effect than shearing from the larger diameter coil towards the smaller diameter coil. As such, an additional step of filing or other manual shaping of the welded joint would be required which is specifically undesirable as described in Van Lierop. And still further, there is no suggestion in Tessmann that using different materials as described in Van Lierop would result in the subsequent hardening of the wire in a manner to increase the tensile strength of the wire and/or to form a doughnut which can be sheared from the weld joint.

In Van Lierop, the diameters of a molybdenum rod and a niobium rod are disclosed as 700 μm and 720 μm, respectively. The lengths of the conductors are on the scale of millimeters. These two rods, after welding, must pass through a lead-through channel 23a, 23b, having an internal diameter of 760 μm. Thus, the lead-through channel will only tolerate a 5.5% increase over the diameter of the larger rod. This tolerance limit is not taught, nor suggested, by the shearing method of Tessmann.

Thus, there is no suggestion or motivation to apply the disclosure of Tessmann which utilizes a single material and relatively crude operative steps with the multitude of materials, melting points, diameters, frequency, minute dimensions, and tolerance limit of Van Lierop. Consequently, claims 1-6 and 13-23 define over any fair teachings attributable to the references either taken singularly or in combination. In addition, neither Van Lierop nor Tessmann recognize the problems addressed by applicants. One skilled in the art, having the cited references before him, would not be informed that the problem solved by applicants ever existed.

<u>Claims 7-10 were Rejected under 35 U.S.C. §103(a) as being Unpatentable Over Van Lierop, et al. in view of Freeman</u>

Applicant has amended claims 7, 8, 9 and 10 such that these claims are now dependent upon independent claim 23. The arguments raised with respect to the above-identified claims are equally appropriate here and will not be repeated. Claims 7, 8, 9 and 10 are not made obvious for at least the reasons stated above. Applicants

request reconsideration and withdrawal of the §103 rejection of claims 7-10 and allowance thereof.

Claim 12 was rejected under 35 U.S.C. §103(a) as being Unpatentable Over Van Lierop, et al. in view of Anderson

Claim 12 has now been amended and is dependent upon independent claim 23. The arguments raised with respect to the above-identified claims are equally appropriate here and will not be repeated. Claim 12 is not made obvious for at least the reasons stated above. Applicants request reconsideration and withdrawal of the Section 103 rejection of claim 12 and allowance thereof.

Claim 11 has been allowed

Applicants gratefully acknowledge the allowance of claim 11 in the present application. Applicants respectfully traverse any implication that allowance is limited to a particular limitation, and hereby reiterate that patentability resides in all of the features as claimed.

## CONCLUSION

For the reasons detailed above, it is respectfully submitted all claims remaining in the application (Claims 1-23) are in condition for allowance. All formal and informal matters have been addressed. This application is in condition for allowance. Early notice to that effect is solicited.

Respectfully submitted,

FAY, SHARPE, FAGAN,
MINNICH & McKEE, LLP

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Date

Timothy E. Nauman

Timothy E. Nauman
Reg. No. 32,283
Karl W. Hauber
Reg. No. 52,999
1100 Superior Avenue
7th Floor
Cleveland, Ohio 44114-2579
(216) 861-5582

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